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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,562	01/18/2002	Kevin K. Chan	YO998-426DIV	9978

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FREDERICK W. GIBB, III  
MCGINN & GIBB, PLLC  
2568-A RIVA ROAD  
SUITE 304  
ANNAPOLIS, MD 21401

EXAMINER

NOVACEK, CHRISTY L

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/051,562

Applicant(s)

CHAN ET AL.

Examiner

Christy L. Novacek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

This Office Action is in response to the preliminary amendment filed January 18, 2002.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 18-24 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Lines 6-8 of claim 18 recite the limitations of forming a double-gate conductor over the gate insulating layer wherein the double-gate conductor includes a first conductor on a first side of the channel and a second conductor on a second side of the channel. However, the gate insulating layer is defined as covering the channel layer and the drain/source regions and, as can be seen in Figure 1A, the insulating layer that covers the channel layer and drain/source regions is overlain by only one conductor of the double-gate conductor and not both the conductors (the other conductor lies underneath the channel/gate insulating layer). Claims 19-24 are rejected because they are dependent upon claim 18.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taur et al. (US 5,646,058, cited in IDS) in view of Goto (JP 05-226655, cited in IDS).

Regarding claim 18, Taur discloses a channel layer (22a/22b), doped drain and source regions (24a/24b/24c) connected to the channel layer, a gate insulating layer (22d/22e/22f/22g/20a/20b/20c) covering the channel layer and the doped drain and source regions, a double-gate conductor over the insulating layer wherein the double-gate conductor includes a first conductor (30) on a first side of the channel layer and a second conductor (34) on a second side of the channel layer, and a lower insulator layer (4) on one side of the double-gate conductor (Fig. 1A-2; col. 2, ln. 54-col. 3, ln. 59). The thickness of the gate insulating layer (22d/22e/22f/22g/20a/20b/20c) is independent of the thickness of the lower insulating layer (4). Taur does not disclose forming an upper insulating layer adjacent a first side of the double-gate conductor. Like Taur, Goto discloses a process of forming a double-gate MOSFET device. Goto teaches that a passivation insulator layer (20) should be formed overlying the upper portion of the double-gate conductor (Fig. 1D). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the invention of Wong et al. by depositing an additional passivation insulator layer as shown by Goto over the double-gate conductor to insulate and protect the gate during subsequent handling and processing as is conventional and well known in the art.

Regarding claim 19, Taur discloses that the first and second conductors are self-aligned by the doped drain and source regions and the gate insulating layer (col. 3, ln. 50-57).

Regarding claims 20 and 23, Taur does not disclose that the source/drain regions are grown from the channel layer. However, Taur does disclose the product of having single-crystal

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epitaxial silicon source/drain regions (col. 3, ln. 13-21; col. 3, ln. 38-40). “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 21, Taur discloses that the epitaxially grown silicon includes silicon (col. 3, ln. 13-21; col. 3, ln. 38-40).

Regarding claim 24, Taur discloses that the channel layer comprises a single crystal silicon layer (col. 3, ln. 38-40).

### ***Allowable Subject Matter***

Claim 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, first paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The primary reason for the indication of the allowable subject matter of claim 22 is the inclusion therein, in combination as currently claimed, of the limitation of forming the source and drain regions of the double-gate conductor such that they comprise both amorphous silicon and epitaxial silicon. This limitation is found in claim 22 and is neither disclosed nor taught by the prior art of record, alone or in combination.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the

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examiner should be directed to Christy L. Novacek whose telephone number is (703) 308-5840.

The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

CLN

February 10, 2003



AMIR ZARABIAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800